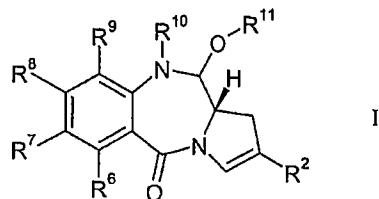


CLAIMS

1. A compound of formula I:



5 and salts, solvates and chemically protected forms thereof, wherein:

R<sup>6</sup> and R<sup>9</sup> are independently selected from H, R, OH, OR, SH, SR, NH<sub>2</sub>, NHR, NRR', nitro, Me<sub>3</sub>Sn and halo;

10 R and R' are independently selected from optionally substituted C<sub>1-12</sub> alkyl, C<sub>3-20</sub> heterocyclyl and C<sub>5-20</sub> aryl groups;

R<sup>7</sup> and R<sup>8</sup> are independently selected from H, R, OH, OR, SH, SR, NH<sub>2</sub>, NHR, NRR', nitro, Me<sub>3</sub>Sn and halo,

or the compound is a dimer with each monomer being of formula (I), where the R<sup>7</sup> groups or R<sup>8</sup> groups of each monomers form together a

15 dimer bridge having the formula -X-R"-X- linking the monomers, where R" is a C<sub>3-12</sub> alkylene group, which chain may be interrupted by one or more heteroatoms and/or aromatic rings, and each X is independently selected from O, S, or NH;

or any pair of adjacent groups from R<sup>6</sup> to R<sup>9</sup> together form a group 20 -O-(CH<sub>2</sub>)<sub>p</sub>-O-, where p is 1 or 2;

R<sup>10</sup> is a carbamate-based nitrogen protecting group;

R<sup>11</sup> is an oxygen protecting group; and

R<sup>2</sup> is a labile leaving group.

25 2. A compound according to claim 1, wherein R<sup>9</sup> is H.

3. A compound according to either claim 1 or claim 2, wherein R<sup>6</sup> is selected from H, OH, OR, SH, NH<sub>2</sub>, nitro and halo.

30 4. A compound according to any one of the preceding claims, wherein R<sup>10</sup> is Troc.

5. A compound according to any one of the preceding claims, wherein  $R^{11}$  is a silyl oxygen protecting group or THP.

6. A compound according to any one of the preceding claims, wherein  $R^2$  is triflate.

7. A compound according to any one of the preceding claims, wherein  $R^7$  and  $R^8$  are independently selected from H, OH, OR, SH, NH<sub>2</sub>, NHR, NRR' and halo.

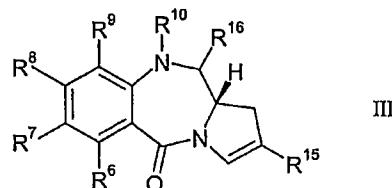
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8. A compound according to any one of claims 1 to 6, wherein the compound is a dimer with each monomer being of formula (I), where the R<sup>7</sup> groups or R<sup>8</sup> groups of each monomer form together a dimer bridge having the formula -O-(CH<sub>2</sub>)<sub>n</sub>-O- linking the monomers, where n is from 3 to 12.

9. A compound according to claim 8, wherein n is from 3 to 7.

10. A compound according to either claim 8 or claim 9, wherein the substituents  $R^8$  join to form the dimer bridge.

11. A compound of formula III:



and salts, solvates, chemically protected forms and prodrugs thereof, wherein:

$R^6$  and  $R^9$  are independently selected from H, R, OH, OR, SH, SR, NH<sub>2</sub>, NHR, NRR', nitro, Me<sub>3</sub>Sn and halo;

R and R' are independently selected from optionally substituted C<sub>1-12</sub> alkyl, C<sub>3-20</sub> heterocyclyl and C<sub>5-20</sub> aryl groups;

30

$R^7$  and  $R^8$  are independently selected from H, R, OH, OR, SH, SR,  $NH_2$ ,  $NHR$ ,  $NRR'$ , nitro,  $Me_3Sn$  and halo,

or the compound is a dimer with each monomer being of formula (I), where the R<sup>7</sup> groups or R<sup>8</sup> groups of each monomers form together a dimer bridge having the formula -X-R"-X- linking the monomers, where R" is a C<sub>3-12</sub> alkylene group, which chain may be interrupted by one or more heteroatoms and/or aromatic rings, and each X is independently selected from O, S, or NH;

5 or any pair of adjacent groups from R<sup>6</sup> to R<sup>9</sup> together form a group -O-(CH<sub>2</sub>)<sub>p</sub>-O-, where p is 1 or 2;

R<sup>10</sup> is a carbamate-based nitrogen protecting group; and

10 R<sup>16</sup> is either O-R<sup>11</sup>, wherein R<sup>11</sup> is an oxygen protecting group, or O-R<sup>11</sup> is OH; or

R<sup>10</sup> and R<sup>16</sup> together form a double bond between N10 and C11;

R<sup>15</sup> is R;

15 and wherein,

when R<sup>7</sup> and R<sup>8</sup> are OMe, R<sup>6</sup> and R<sup>9</sup> are H, and where R<sup>10</sup> and R<sup>16</sup> together form a double bond between N10 and C11, R<sup>15</sup> is not phenyl, 4-methylphenyl, 2-methylphenyl, 4-ethylphenyl, 2,6-dimethylphenyl, 4-methoxyphenyl, 4-tert-butylphenyl, 4-fluorophenyl, 4-chlorophenyl, 2-naphthyl or 2-thiophenyl.

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12. A compound according to claim 11, wherein when R<sup>7</sup> and R<sup>8</sup> are OMe, R<sup>6</sup> and R<sup>9</sup> are H, and R<sup>15</sup> is R, R is selected from the group 3-methoxyphenyl, 4-biphenyl, 4-phenoxyphenyl, 3,4-methylenedioxyphenyl, trans-2-(4-methylphenyl)vinyl, trans-25 propenyl, 4-dimethylaminophenyl, 4-methylthiophenyl, 4-vinylphenyl, 3,4-dichlorophenyl, 4-trifluoromethylphenyl, 4-isopropylphenyl, 4-cyanophenyl, 3-pyridinyl, 4-pyridinyl, 4-formylphenyl, 4-carboxylphenyl, 2,6-dimethoxyphenyl, 4-acetanilide, 4-aminophenyl, 1-naphthyl, 5-indole, 3-aminophenyl, 2,6-difluorophenyl, 1-pyrenyl, 30 4-hydroxyphenyl and trans-hexenyl.

13. A compound according to either claim 11 or claim 12, wherein when R<sup>7</sup> and R<sup>8</sup> are OMe, R<sup>6</sup> and R<sup>9</sup> are H, and R<sup>15</sup> is R, R is selected from a C<sub>3-20</sub> heterocyclyl group having a nitrogen ring atom, C<sub>5-20</sub> aryl group having a nitrogen-containing substituent, or a C<sub>5-20</sub>

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heteroaryl group having a nitrogen ring atom or a nitrogen-containing substituent.

14. A compound according to claim 11, wherein the compound is a dimer with each monomer being of formula (I), where the R<sup>7</sup> groups or R<sup>8</sup> groups of each monomer form together a dimer bridge having the formula -O-(CH<sub>2</sub>)<sub>n</sub>-O- linking the monomers, where n is from 3 to 12.

10 15. A compound according to claim 14, wherein n is from 3 to 7.

16. A compound according to either claim 14 or claim 15, wherein the substituents R<sup>8</sup> join to form the dimer bridge.

15 17. A compound according to any one of claims 14 to 16, wherein R<sup>15</sup> is selected from:

- (i) optionally substituted C<sub>5-20</sub> aryl groups;
- (ii) substituted C<sub>2</sub> alkyl groups; and
- (iii) optionally substituted C<sub>3-7</sub> alkyl groups.

20

18. A compound according to any one of claims 11 to 17, wherein R<sup>10</sup> and R<sup>16</sup> together form a double bond between N10 and C11.

25 19. A compound according to any one of claims 11 to 18, wherein R<sup>9</sup> is H.

20. A compound according to any one of claims 11 to 19, wherein R<sup>7</sup> and R<sup>8</sup> are independently selected from H, OH, OR, SH, NH<sub>2</sub>, NHR, NRR' and halo.

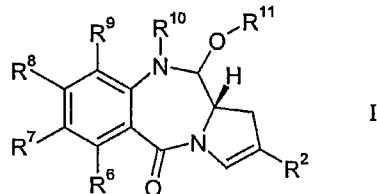
30 21. A compound according to any one of claims 11 to 20 for use in a method of therapy.

22. A pharmaceutical composition containing a compound of any one of claims 11 to 20, and a pharmaceutically acceptable carrier or diluent.

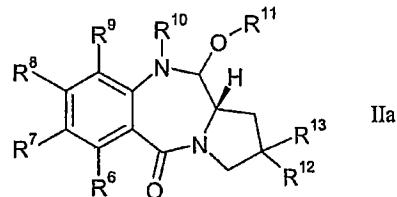
5 23. Use of a compound according to any one of claims 11 to 20 in the manufacture of a medicament for treating a proliferative disease.

10 24. A method of treatment of a proliferative disease, comprising administering to a subject in need of treatment a therapeutically-effective amount of a compound of any one of claims 11 to 20.

25. A method of synthesising a compound of formula I:



15 from a compound of formula IIa:



wherein:

R<sup>6</sup> and R<sup>9</sup> are independently selected from H, R, OH, OR, SH, SR, NH<sub>2</sub>, NHR, NRR', nitro, Me<sub>3</sub>Sn and halo;

20 R and R' are independently selected from optionally substituted C<sub>1-12</sub> alkyl, C<sub>3-20</sub> heterocyclyl and C<sub>5-20</sub> aryl groups;

R<sup>7</sup> and R<sup>8</sup> are independently selected from H, R, OH, OR, SH, SR, NH<sub>2</sub>, NHR, NRR', nitro, Me<sub>3</sub>Sn and halo,

or the compound is a dimer with each monomer being of formula (I),

25 where the R<sup>7</sup> groups or R<sup>8</sup> groups of each monomers form together a dimer bridge having the formula -X-R"-X- linking the monomers, where R" is a C<sub>3-12</sub> alkylene group, which chain may be interrupted

by one or more heteroatoms and/or aromatic rings, and each X is independently selected from O, S, or NH; or any pair of adjacent groups from R<sup>6</sup> to R<sup>9</sup> together form a group -O-(CH<sub>2</sub>)<sub>p</sub>-O-, where p is 1 or 2;

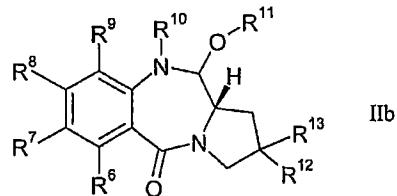
5 R<sup>10</sup> is a carbamate-based nitrogen protecting group;

R<sup>11</sup> is an oxygen protecting group;

R<sup>2</sup> is a labile leaving group; and

R<sup>12</sup> and R<sup>13</sup> together form =O.

10 26. A method according to claim 25, wherein the compound of formula IIa is synthesised from a compound of formula IIb:



wherein said compound of formula IIb has R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, R<sup>9</sup>, R<sup>10</sup> and R<sup>11</sup> defined according to claim 25, and for said compound of formula IIb

15 R<sup>12</sup> is O-R<sup>14</sup>, and R<sup>13</sup> is H; and

R<sup>14</sup> is an oxygen protecting group orthogonal to R<sup>11</sup>.

27. A method according to claim 26, wherein the compound of formula IIa is synthesised using an oxidation reaction performed

20 under Swern conditions, or a method involving the TPAP or the Dess Martin reagents.

28. A method according to any one of claims 25 to 27, wherein when R<sup>2</sup> in the compound of formula I is -OSO<sub>2</sub>CH<sub>3</sub>, -OSO<sub>2</sub>(C<sub>n</sub>F<sub>2n+1</sub>) where

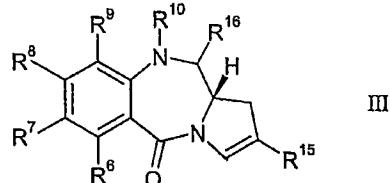
25 n = 0, 1 or 4, or -OSO<sub>2</sub>R<sup>s</sup> where R<sup>s</sup> is an optionally substituted phenyl group, then said compound of formula I is synthesised by using a treatment step with the appropriate R<sup>2</sup> anhydride.

29. A method according to any one of claims 25 to 27, wherein

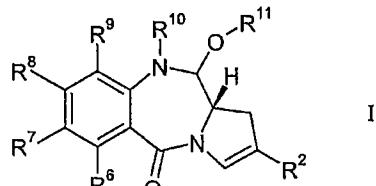
30 when R<sup>2</sup> in the compound of formula I is -I or -Br, then said compound of formula I is synthesised by using a reaction step involving hydrazine and iodine or bromine.

30. A method according to any one of claims 25 to 27, wherein when R<sup>2</sup> in the compound of formula I is -Cl, then said compound of formula I is synthesised by using a reaction step involving 5 phosphorous oxychloride.

31. A method of synthesising a compound of formula III:



from a compound of formula I:



10

wherein

R<sup>6</sup> and R<sup>9</sup> are independently selected from H, R, OH, OR, SH, SR, NH<sub>2</sub>, NHR, NRR', nitro, Me<sub>3</sub>Sn and halo;

R and R' are independently selected from optionally substituted

15 C<sub>1-12</sub> alkyl, C<sub>3-20</sub> heterocyclyl and C<sub>5-20</sub> aryl groups;

R<sup>7</sup> and R<sup>8</sup> are independently selected from H, R, OH, OR, SH, SR, NH<sub>2</sub>, NHR, NRR', nitro, Me<sub>3</sub>Sn and halo,

or the compound is a dimer with each monomer being of formula (I),

where the R<sup>7</sup> groups or R<sup>8</sup> groups of each monomers form together a

20 dimer bridge having the formula -X-R"-X- linking the monomers,

where R" is a C<sub>3-12</sub> alkylene group, which chain may be interrupted by one or more heteroatoms and/or aromatic rings, and each X is independently selected from O, S, or NH;

or any pair of adjacent groups from R<sup>6</sup> to R<sup>9</sup> together form a group

25 -O-(CH<sub>2</sub>)<sub>p</sub>-O-, where p is 1 or 2;

R<sup>10</sup> is a carbamate-based nitrogen protecting group;

R<sup>2</sup> is a labile leaving group;

$R^{16}$  is either  $O-R^{11}$ , where  $R^{11}$  is an oxygen protecting group, or  $OH$ , or  $R^{10}$  and  $R^{16}$  together form a double bond between  $N10$  and  $C11$ ; and  $R^{15}$  is  $R$ .

5 32. A method according to claim 31, wherein the synthesis of said compound of formula **III** uses a palladium catalysed coupling step.

33. A method according to claim 32, wherein the palladium catalyst is  $Pd(PPh_3)_4$ ,  $Pd(OCOCH_3)_2$ ,  $PdCl_2$  or  $Pd(dba)_3$ .

10 34. A method according to either claim 32 or claim 33, wherein the coupling reaction is performed under microwave conditions.

15 35. A method according to any one of claims 32 to 34, wherein the palladium catalyst is solid supported.